

The Next Frontier in Technology – the “Internet of Things”

Overview and implications of an investment theme beginning to come to life

At the beginning of this year, Google announced its acquisition of Nest Labs, a smart home device company which creates thermostats that can be controlled from your phone and also have some ability to adapt its temperature settings from its users way of life. Google’s venture into the home appliances market is illustrative of what many believe is the next big frontier in technology- the “internet of things.”

We’ve all become accustomed to connected mobile phones and personal computers- the upcoming evolution will bring the internet to a whole new suite of home and personal devices, such as toothbrushes, refrigerators, washing machines, thermostats and even clothing. All kinds of personal appliances and gadgets will talk to their owners—and to each other—via the internet. This concept has captured the imagination of technology gurus across the world, with the possibility that every object we interact with daily can be capitalized. How? By connecting these devices to the internet, we enable them to create intellectual capital. Through various sensors, screens and transmission mechanisms, these devices are able to capture an extremely valuable dataset – our personal behavior. Data on our personal habits and preferences will be invaluable to companies looking to position and market new products. In this month’s Thinking Man, we explore this concept and look at potential investment plays based on this theme.

The Internet: Coming to a Home and Personal Device Near You

Over the last decade, there has been an explosion in the number of internet-enabled devices. This evolution is chronicled by Dave Evans, Cisco’s Chief Futurist, in his paper “The Internet of Things: How the Next Evolution of the Internet is Changing Everything.” In 2003, there were approximately 500 million connected devices to the internet. In 2007, the Apple iPhone was released, and in the years that followed, the use of smart phones and tablets skyrocketed. In 2010, it was estimated that the number of internet-enabled devices was 12.5

The Thinking Man’s Approach



April 2014 | Series #19
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Since the start of 2014, we’ve seen several new “smart” home and personal devices showcased by companies like Google, Samsung, LG and Procter & Gamble. These connected home and personal devices represent the actualization of what many believe is the next big frontier in technology, “the internet of things.” In this month’s Thinking Man, we look to explore the evolution of “the internet of things” and discuss the main value we believe this theme generates- powerful data portfolios about our personal behavior. Finally, we look at some potential investment plays based on this theme.

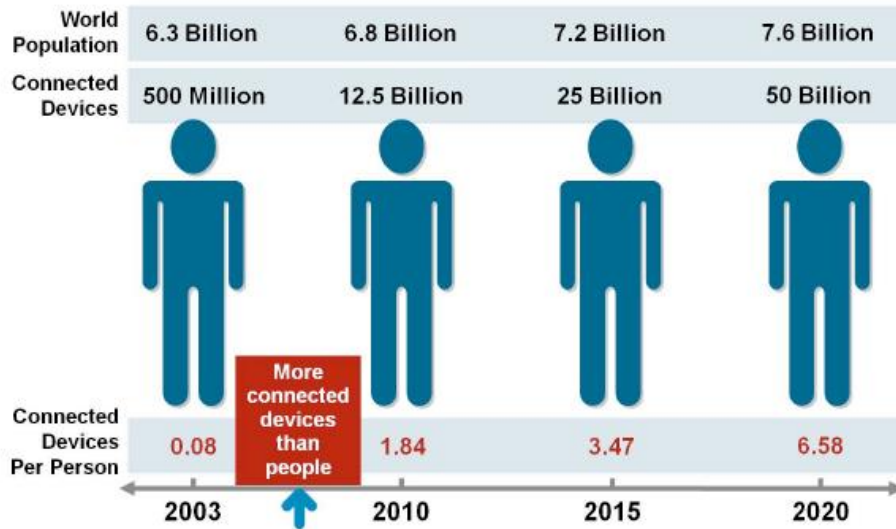
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billion- almost double the amount of the human population. Cisco estimates that by 2020, there will be 50 billion devices connected to the internet – estimating that each person will have 6 connected devices.¹ (See Graphic 1 below).

Graphic 1: Evolution of Connected Devices and World Population



Source: Cisco IBSG, April 2011

Advances in technology have lowered the cost of connectivity and also the cost of sensor nodes- gadgets commonly used to connect to the internet which allow for the ability to collect and transmit data. An everyday appliance can become a smart device that provides information by adding a sensor

node. McKinsey estimates that in 2010 there were 30 million networked sensor nodes, and since then the number has grown by 30% per year.²

Over the last few months we have seen the “internet of things” move past a concept discussed in tech blogs and consulting reports into actualized products and corporate action. This January, around the same time that Google announced its entry into the smart thermostat market, LG and Samsung showcased a suite of smart appliances at the International Consumer Electronic Show held in Las Vegas, Nevada. Samsung debuted its Smart Home service, which enables a user to manage their internet-connected kitchen appliances, television, thermostat, and lighting system all through a single app. These devices can communicate with each other- if your oven needs repair it can send a message to your smart phone; and if you have Galaxy Gear wearable device (a sort of mini smart phone watch) you can speak into it and voice control your television or the lights in your house.³ At the same show, LG unveiled its new technology called HomeChat, a feature which allows its suite of smart appliances to communicate directly with a user in a chat like manner. LG teamed up with the LINE, a Korean messaging platform, to create a system where a user can text questions to any of these connected home appliances – you can check in with your washing machine and it will reply back to you what cycle it is in; your refrigerator can text you how many eggs you have left, and your robotic vacuum would tell you the last time it cleaned.⁴

¹ Cisco, “The Internet of Things: How the Next Evolution of the Internet is Changing Everything,” April 2011

² McKinsey Global Institute, “Big data: The next frontier for innovation, competition, and productivity,” June 2011

³ Samsung, “Samsung Unveils New Era of Smart Home at CES 2014,” January 5, 2014

⁴ Olson, Parmy. “Ready To Text The Fridge? LG’s Partnership With LINE Lets You Message Home Appliances,” *Forbes*. January 6, 2014



Personal devices are also becoming internet enabled. A few weeks ago, Procter & Gamble demonstrated its first web-enabled toothbrush. The brush links with a smartphone and records the user's brushing habits- and will then analyze the data and make suggestions on how to improve brushing techniques. P&G isn't the only one looking to bring a smart toothbrush to market- French startup Kolibree showed their version of smart toothbrush in January, which has nine motion sensors and an algorithm to send information on which quadrants a user is brushing.¹ Another trend in personal devices are "wearables," a term for wearable technology. In mid March, Google announced its venture into "Android Wear," and the company's focus on creating an Android watch with the ability to track information about health and fitness, as well as connect to a phone or TV. Other companies are also in the "wearables" game- at the end of March, Intel completed its purchase of Basis Science, one of the first fitness watch companies.

Value in Smart Products: the Power of the Data Portfolios

One way to characterize the value of these internet-enabled smart gadgets is the convenience and utility they provide the end consumer. Another- potentially much more powerful- way to assess their value is to think about the data and information they can provide on the end consumer's habits and behaviors. A smart refrigerator can take inventory on the food and beverages it stores- and create a data portfolio of the buying and consumption habits of its user. This information has enormous implications for food and beverage companies- they can suggest new, complementary or alternative products for consumers based on their purchase history. Wearable smart watches are currently being geared to track exercise routines- valuable information for exercise and health-related companies. For every smart enabled home and personal device, there is a data portfolio of information on our personal behavior- providing a profile of our habits and preferences for companies to take advantage of, when positioning and marketing new products.

The concept of building a profile of our personal behavior is not new- companies like Google and Facebook have been doing this over the last decade, taking our internet activity - our searches, purchases, online social interactions- to build a personal profile. These companies have benefitted from creating financial value from our personal data- they sell information on our preferences and habits to advertisers who can make better targeted ads. The "internet of things" represents an important next stage in this process- instead of the information of our personal behavior coming from human created content (like our actions on the internet) this information will come from physical objects- like our home appliances and personal devices. This opens a whole new realm of possibility to create intellectual capital- there will be many more data sources to build a comprehensive profile of our preferences and habits, which allows for the capability to provide new value propositions to potential customers. Those companies who are able to play an important role in processing and analyzing the data from such devices are set to clearly benefit.

¹ Schechner, Sam. "Web-Enabled Toothbrushes Join the Internet of Things," Wall Street Journal. March 2, 2014



Investment Plays

As illustrated by several examples in this note, just in the last couple of months, we are seeing evidence of the “internet of things” taking root in our society, with several different companies showcasing new smart products. A question investors may have is how to take advantage of this investment theme.

One way to invest is through the players who are typically closest to new and developing technologies- through venture capital funds. There are many small technology firms focusing on creating a specific product or technology related to the “internet of things”- and venture capital is the best way to gain investment access to these types of companies. These companies can potentially benefit from the giant technology or consumer electronics companies buying their devices or platforms- like LG buying LINE's texting platform or Intel buying Basis's wearable fitness watch. For those clients interested in this route, we help source and vet managers in the space. One of our clients is investing in an Israeli venture capital fund, with an underlying holding in a “smart” security company, relating to the “internet of things” theme. This company is looking to capitalize on facial recognition software, and this may eventually be used as a consumer product for home security purposes. While these may be interesting investment opportunities for some, investing in venture capital is a high risk proposition, and it is only appropriate for clients with a very specific risk tolerance and portfolio profile.

For those clients looking to play this theme in the public markets, we believe the companies best positioned at this early stage of the “internet of things” trend are those companies who have already been in the business of creating financial value from our personal data. These are companies like Google and Facebook- who have already built up processes and systems to handle this information, they also have better databases and employ the best data engineers. Amazon has experience with analyzing a diverse range of your consumption patterns- and can now predict your purchases, giving users the option of having frequently used goods shipped before placing an order. These are a few of the names we could see benefit; but investors have to be highly selective when buying into the bubbly tech sector- which can still look richly priced despite the recent sell-off.

Clients should consider their own risk profiles and portfolios when thinking about potential investment actions for this theme. For more information on the plays we are looking at to capitalize on the “internet of things”, please contact your advisor or info@bigsurpartners.com



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